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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SHERMAN, STEPHEN G

ART UNIT PAPER NUMBER

2629

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/733,401	Applicant(s) NAM ET AL.	
	Examiner Stephen G. Sherman	Art Unit 2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa et al. (US 2006/0152658) in view of Ozawa (US 7,092,062) and further in view of Yanagi (JP 2000-111910 A).

Regarding claim 1, Ozawa et al. disclose a trans-reflective liquid crystal display device comprising:

a plurality of data and gate lines defining a plurality of pixels (Figure 12 and paragraph [0160] explain that scanning lines 151 and data lines 152 have pixels 153 formed at their intersection.), the pixels having a reflection region and a transmission region (Figure 6B shows a pixel structure containing a reflection region and a transmission region.);

a timing controller that receives, converts, and outputs image data (Figure 21 and paragraphs [0193]-[0194] explain that timing generator 573 controls the display-data outputting source 570 and the display-data processing circuit 571 to output display data.);

a gate driver that receives a gate signal from the timing controller (Figure 12 shows a scanning driver circuit 157 as explained in paragraphs [0160] and [0195].);

a data driver that receives a data signal from the timing controller (Figure 12 shows a data driver circuit 158 as explained in paragraphs [0160] and [0195].);

a liquid crystal display panel with a TFT array substrate and a color filter substrate, the liquid crystal display panel displaying the image according to a gate pulse and a data voltage applied by the gate driver and the data driver (Figure 13 and paragraphs [0160]-[0161] and [0169] explain that there is a TFT substrate and a substrate for the color filters, and also the scanning and data drivers driver the scanning and data lines, which would be done by gate pulses and data voltages.); and

a backlight (Paragraph [0072] and Figure 6B).

Ozawa et al. fail to explicitly teach of a switching unit that determines the output signal of the timing controller according to a transmission mode or reflection mode,

wherein the backlight is turned on in a transmission mode to sequentially transmit the light into the transmission region and is turned off in a reflection mode.

Ozawa discloses that in a display utilizing a reflective and transmissive mode in which the modes are switched based upon the detection of the ambient light (Column 1, lines 18-35.), wherein the backlight is turned on in a transmission mode to sequentially transmit the light into the transmission region and is turned off in a reflection mode (Column 1, lines 18-35, the examiner understands that when in the reflection mode the backlight would be turned off since power savings is achieved.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the switching mode taught by Ozawa with the trans-reflective liquid crystal device taught by Ozawa et al. in order to present a distinct display under dark conditions while saving power.

Ozawa et al. and Ozawa fail to disclose that the backlight is a sequential backlight including red, green, and blue lamps.

Yanagi discloses of a sequential backlight including red, green and blue lamps (Drawing 1 and paragraphs [0011]-[0012] explain of a sequential backlight using red, green and blue.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use a sequential backlight as taught by Yanagi with the trans-reflective display taught by the combination of Ozawa et al. and Ozawa in order to provide a display in which superior hue can be established.

Regarding claim 2, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Ozawa et al. also disclose wherein the color filter substrate includes a color filter formed in the reflection region (Paragraph [0169] explains that there is a color filter in the reflection region, see also Figure 6B.).

Regarding claim 3, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Yanagi also discloses a device further comprising a backlight controller connected to the sequential backlight to control the timing of the light emissions in the transmission mode (Drawing 3 and paragraph [0020].).

Regarding claim 4, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Although Ozawa et al., Ozawa and Yanagi fail to explicitly teach wherein the data driver includes a MUX circuit shorting three adjacent data lines, the MUX circuit being turned on in the transmission mode and turned off in the reflection mode, the examiner interprets that given the combination of references, that when the backlight is on that the same display data will be transmitted to three adjacent data line (red, green and blue), as explain in Yanagi in Drawing 5 that shows the same data voltage being applied during every sub frame, and that when the backlight is OFF that the display data applied

to the pixels will all be different since the reflection through the color filter will create the color of the display.

Regarding claim 5, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Yanagi also discloses wherein the lamp backlight includes a light emitting diode (Drawing 1).

Regarding claim 6, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Ozawa et al. also disclose wherein the cell gap between in the transmission region is twice that in the reflection region (Figure 6B shows that the cell gap in the transmission region, represented by d , can be seen to be twice the size of the gap in the reflection region.).

Regarding claim 7, Ozawa et al., Ozawa and Yanagi disclose the trans-reflective liquid crystal display device of claim 1.

Yanagi also discloses wherein a timing controller divides one frame of display data into three sub-frames (Drawing 5a and 5b show that the a frame is divided into a section of displaying red, one for displaying green and one for displaying blue.).

Regarding claim 8, this claim is rejected under the same rationale as claim 1.

Regarding claim 9, please refer to the rejection of claim 7, and further more Yanagi also discloses of applying the same data voltage to the adjacent three pixels every sub frame in the transmission mode (Drawing 5 shows that the same data voltage is applied during every sub frame.).

Regarding claim 10, please refer to the rejection of claim 4.

Regarding claim 11, please refer to the rejection of claims 1 and 2, and furthermore Ozawa et al. also disclose a reflective electrode in the reflection region to reflect light incident from outside the liquid crystal panel (Figure 6B shows the reflecting electrode 4 as explained in paragraph [0118].).

Regarding claim 12, this claim is rejected under the same rationale as claim 5.

Regarding claim 13, Ozawa et al., Ozawa and Yanagi disclose the liquid crystal display device of claim 11.

Ozawa et al. also disclose wherein the liquid crystal panel includes:

a second substrate (Figure 6B shows substrate 20.); and

a liquid crystal layer between the first and second substrate (Figure 6B shows a liquid crystal layer 50.).

Regarding claim 14, Ozawa et al., Ozawa and Yanagi disclose the liquid crystal display device of claim 11.

Ozawa et al. also disclose wherein the switching device includes a thin film transistor (Figure 18).

Regarding claim 15, this claim is rejected under the same rationale as claim 6.

Regarding claim 16, please refer to the rejection of claim 1.

Regarding claim 17, please refer to the rejection of claim 1.

Regarding claim 18, this claim is rejected under the same rationale as claim 3.

Regarding claim 19, please refer to the rejection of claim 1.

Regarding claim 20, this claim is rejected under the same rationale as claim 4.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamazaki (US 2005/0088403) discloses of using LEDs as a backlight for a liquid crystal display in order to reduce power consumption and also using the LED backlight in a reflective display.

Maeda et al. (US 2005/0195346) disclose of a liquid crystal display that can provide a display with high contrast in both a transmission mode and a reflection mode.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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20 October 2006

AMR A. AWAD
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read "Amr A. Awad", is written over the printed name and title.